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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
| 10/731,168 | 12/10/2003 | Sven Thate | 54129 | 5053 |
| 26474 | 7590 | 12/17/2008 | EXAMINER | |
| NOVAK DRUCE DELUCA + QUIGG LLP | | | ONIILL, KARIE AMBER | |
| 1300 EYE STREET NW | | | ART UNIT | PAPER NUMBER |
| SUITE 1000 WEST TOWER | | | 1795 | |
| WASHINGTON, DC 20005 | | | MAIL DATE | |
| | | | 12/17/2008 | |
| | | | DELIVERY MODE | |
| | | | PAPER | |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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|------------------------------|--------------------------------------|-------------------------------------|
| Office Action Summary | Application No. 10/731,168 | Applicant(s) THATE ET AL. |
| | Examiner Karie O'Neill | Art Unit 1795 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 22 September 2008.

2a) This action is FINAL. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-13 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 1-13 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some * c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

| | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/US/02) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>9-22-08</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response

1. The Applicant's amendment filed on September 22, 2008, was received. Claim 6 has been amended. No claims have been cancelled. Non claims have been withdrawn from consideration. Therefore, Claims 1-13 are pending in this office action.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d) or (f), which papers have been placed of record in the file.

Information Disclosure Statement

3. Information disclosure statement (IDS), submitted September 22, 2008, has been received and considered by the examiner.

Claim Rejections - 35 USC § 102

4. The rejection of Claims 1-13 under 35 U.S.C. 102(b) as being anticipated by Tabata et al. (US 6,723,464 B2) have been overcome based on the arguments presented on pages 7-8 of Remarks dated September 22, 2008.

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5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-11 and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Bradley (US 6,346,182 B1).

With regard to Claim 1, Bradley discloses a method of fabricating a membrane-electrode assembly (MEA), wherein the MEA comprises a polymer-electrolyte membrane (PEM) of cellulose paper sheets (28), having reaction layers applied to both sides, wherein at least one of the reaction layers includes at least one catalytic component within a liquid (26) and an electron conductor (12), and wherein the method comprises the following steps:

(A) introducing ions of the at least one catalytic component into the polymer-electrolyte membrane (28), this being done by immersing the cellulose sheets (28) into the liquid environment (26) containing the catalyst (column 14 lines 19-34);

(B) applying the electron conductor (12) to one side of the polymer-electrolyte membrane (28) (column 14 lines 19-34);

(C) electrochemically depositing the ions of the catalytic component from the polymer-electrolyte membrane (28), introduced into the reaction layers from the liquid (26) contained in the vessel (24), onto the electron conductor (12) on at least one side of the polymer-electrolyte membrane (28) (column 14 lines 35-57). Bradley does not specifically disclose the electron conductor being applied to "both" sides of the polymer

electrolyte membrane, however, a reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. See MPEP 2112. Bradley discloses that the sheets (28) with the electron conductor (12) are stacked and sandwiched between two electrodes (14,16) which anticipates that the electron conductor would then be present on both sides of the membrane (28) if it isn't already. Also, the phrases "particularly for PEM fuel cells" and "optionally having gas diffusion layers" are given little to no patentable weight since the words "particularly" and "optionally" do not make these claim limitations a requirement.

With regard to Claims 2 and 3, Bradley discloses wherein the electrochemical deposition of the ions of the catalytic component in step (C) is carried out under fuel cell conditions and wherein a variation of operating conditions, such as applying a voltage differential between electrodes every fifteen minutes at different intensities, is effected during the deposition under fuel cell conditions (column 14 lines 35-38). Since the clarity of fuel cell conditions has not been established in the claims, it is inherent that the electrochemical deposition takes place under fuel cell conditions since a fuel cell is an electrochemical cell comprising an anode, a cathode, a membrane and an electric field which is applied to induce an electrochemical reaction.

With regard to Claims 4 and 5, Bradley discloses wherein the electrochemical deposition of the ions of the catalytic component in step (C) is carried out under electrolytic conditions, wherein the electrolytic conditions comprise the application of a

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constant or time-variant DC voltage or an AC voltage (column 11 lines 54-62 and column 14 lines 35-38).

With regard to Claim 6, Bradley discloses a method of fabricating a membrane-electrode assembly (MEA), wherein the MEA comprises a polymer-electrolyte membrane (PEM) of cellulose paper sheets (28), having reaction layers applied to both sides, wherein at least one of the reaction layers includes at least one catalytic component within a liquid (26) and an electron conductor (12), and wherein the method comprises the following steps:

(A) introducing ions of the at least one catalytic component into the polymer-electrolyte membrane (28), this being done by immersing the cellulose sheets (28) into the liquid environment (26) containing the catalyst (column 14 lines 19-34);

(B) applying the electron conductor (12) to one side of the polymer-electrolyte membrane (28) (column 14 lines 19-34);

(C) electrochemically depositing the ions of the catalytic component from the polymer-electrolyte membrane (28), introduced into the reaction layers from the liquid (26) contained in the vessel (24), onto the electron conductor (12) on at least one side of the polymer-electrolyte membrane (28) (column 14 lines 35-57), wherein in step (C) at least one element from the 3rd to 14th group of the periodic table of the elements is deposited as the catalytic component onto the electron conductor on at least one side of the polymer-electrolyte membrane (column 9 lines 4-15). Bradley does not specifically disclose the electron conductor being applied to "both" sides of the polymer electrolyte membrane, however, a reference which is silent about a claimed invention's features is

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inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. See MPEP 2112. Bradley discloses that the sheets (28) with the electron conductor (12) are stacked and sandwiched between two electrodes (14,16) which anticipates that the electron conductor would then be present on both sides of the membrane (28) if it isn't already. Also, the phrases "particularly for PEM fuel cells" and "optionally having gas diffusion layers" are given little to no patentable weight since the words "particularly" and "optionally" do not make these claim limitations a requirement.

With regard to Claims 7 and 8, Bradley discloses wherein in step (C) at least one of the elements Pt, Co, Fe, Cr, Mn, Cu, Ru, Pd, Ni, Mo, Sn, Zn, Au, Ag, Rh, or Ir is deposited as the catalytic component on the cathode-side electron conductor and the anode-side electron conductor (column 9 lines 4-15).

With regard to Claim 9, Bradley discloses wherein the electron conductor (12) comprises carbon in the form of graphite or known forms of conductive diamond (column 7 lines 48-54).

With regard to Claim 10, Bradley discloses wherein the electron conductor (12) applied in step (B) comprises at least one catalytic component from the group consisting of Pt, Co, Fe, Cr, Mn, Cu, V, Ru, Pd, Ni, Mo, Sn, Zn, Au, Ag, Rh, Ir or W (column 7 lines 54-58).

With regard to Claim 11, Bradley discloses wherein in step (B), together with the electron conductor (12), an ion conductor is applied to at least one side of the polymer-electrolyte membrane. The composition of the electrically consecutive particulate (12)

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may include a conductive form of carbon, a metal, a metal alloy, a conductive metal oxide, a conductive polymer, a conductive organic salt crystal, or mixtures thereof.

Examples of the conductive polymer include polypyrrole, polyalanine or polythiophene (column 7 lines 48-61).

With regard to Claim 13, Bradley discloses a method of fabricating a membrane-electrode assembly (MEA), wherein the MEA comprises a polymer-electrolyte membrane (PEM) of cellulose paper sheets (28), having reaction layers applied to both sides, wherein at least one of the reaction layers includes at least one catalytic component within a liquid (26) and an electron conductor (12), and wherein the method comprises the following steps:

(A) introducing ions of the at least one catalytic component into the polymer-electrolyte membrane (28), this being done by immersing the cellulose sheets (28) into the liquid environment (26) containing the catalyst (column 14 lines 19-34);

(B) subsequently, applying the electron conductor (12) to one side of the polymer-electrolyte membrane (28) (column 14 lines 19-34);

(C) electrochemically depositing the ions of the catalytic component from the polymer-electrolyte membrane (28), introduced into the reaction layers from the liquid (26) contained in the vessel (24), onto the electron conductor (12) on at least one side of the polymer-electrolyte membrane (28) (column 14 lines 35-57). Bradley does not specifically disclose the electron conductor being applied to "both" sides of the polymer electrolyte membrane, however, a reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that

which is described in the reference. See MPEP 2112. Bradley discloses that the sheets (28) with the electron conductor (12) are stacked and sandwiched between two electrodes (14,16) which anticipates that the electron conductor would then be present on both sides of the membrane (28) if it isn't already. Also, the phrases "particularly for PEM fuel cells" and "optionally having gas diffusion layers" are given little to no patentable weight since the words "particularly" and "optionally" do not make these claim limitations a requirement.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bradley (US 6,346,182 B1).

Bradley discloses the method of fabricating a membrane electrode assembly in paragraph 6 above, including wherein the catalytic component is in a concentration of about 0.05 mM to about 10 mM (column 9 lines 31-32).

Bradley does not disclose wherein in step (A) the catalytic component is introduced into the polymer electrolyte membrane in an amount of from 0.000005 to 0.05 mmol/cm². However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use catalyst component in an amount of

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0.000005 to 0.05 mmol/cm² so as to allow electrodeposition to occur at a reasonably efficient rate but not so much that the conductivity will be too high to apply the electric field at the intensity or strength desired (column 9 lines 31-37.) It has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. See MPEP 2144.05.

Response to Arguments

9. Applicant's arguments with respect to the claims, as being rejected under 35 U.S.C. 102(b) as being anticipated by Tabata et al. (US 6,723,464 B2), have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karie O'Neill whose telephone number is (571)272-8614. The examiner can normally be reached on Monday through Friday from 8am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark Ruthkosky/
Primary Examiner, Art Unit 1795

Karie O'Neill
Examiner
Art Unit 1795

KAO